

WHAT IS CLAIMED IS:

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1. A bicycle charge control circuit for receiving electric power from a bicycle dynamo and for controlling the operation of a lamp and a charging circuit, the circuit comprising:  
a first lamp switch for selectively providing power from the dynamo to the lamp;  
a battery charged by the dynamo; and  
a lamp control circuit operatively coupled to the first lamp switch and to the battery to control the first lamp switch to intermittently supply power to the lamp when the battery voltage is below a selected value.

2. The circuit according to claim 1 further comprising a rectifier that rectifies power from the dynamo to the battery.

3. The circuit according to claim 2 wherein the lamp control circuit controls the first lamp switch to supply power to the lamp at intervals approximately equal to half-cycles of the output voltage of the dynamo.

4. The circuit according to claim 1 further comprising:  
a charging switch for selectively providing power from the dynamo to the battery; and  
a charging switch control circuit that controls the operation of the charging switch.

5. The circuit according to claim 4 wherein the charging switch comprises a charging transistor, and wherein the charging switch control circuit comprises:

a first capacitance charged by current output by the dynamo during one of a positive half-cycle and a negative half-cycle thereof; and

a second capacitance charged by current output by the dynamo during the other one of the positive half cycle and the negative half-cycle thereof as well as by current from the first capacitance;

wherein voltage from at least one of the first and second capacitances is applied to a control terminal of the charging transistor.

6. The circuit according to claim 5 wherein the first capacitance is charged by current output by the dynamo during the positive half-cycle thereof, and wherein the second capacitance is charged by current output by the dynamo during the negative half-cycle thereof as well as current from the first capacitance.

7. The circuit according to claim 1 wherein the battery comprises a battery capacitance.

8. The circuit according to claim 1 wherein the first lamp switch comprises a first lamp transistor.

9. The circuit according to claim 8 further comprising a second lamp transistor connected in series with the first lamp transistor, and wherein the lamp control circuit controls the second lamp switch based on a voltage of the battery.

10. A bicycle charge control circuit for receiving electric power from a bicycle dynamo and for controlling the operation of a lamp and a charging circuit, the circuit comprising:

a lamp switch for selectively providing power from the dynamo to the lamp;

a battery charged by the dynamo; and

a lamp control circuit operatively coupled to the lamp switch and to the battery to control the lamp switch to intermittently supply power to the lamp when the battery voltage is below a selected value, wherein the lamp control circuit comprises:

a first capacitance;

a first diode coupled for communicating power from the dynamo to the first capacitance during one of a positive half-cycle and a negative half-cycle of the dynamo;

a second capacitance; and

a second diode coupled for communicating power from the dynamo to the second capacitance during the other one of the positive half-cycle and the negative half-cycle of the dynamo as well as current from the first capacitance.

11. The circuit according to claim 10 wherein the battery comprises a third capacitance.

12. The circuit according to claim 11 further comprising a first transistor for selectively providing power from the dynamo to the battery, wherein voltage from at least one of the first and second capacitances is applied to a control terminal of the first transistor.

13. The circuit according to claim 12 wherein the lamp switch comprises a second transistor having a control terminal coupled for receiving a voltage from the second capacitance.

14. The circuit according to claim 13 wherein the lamp switch comprises a third transistor coupled in series with the second transistor, wherein the third transistor has a control terminal coupled to the lamp control circuit so that the third transistor is turned on when the battery voltage is above the selected value.

15. The circuit according to claim 14 further comprising a third diode for rectifying power from the dynamo to the battery.

16. The circuit according to claim 15 further comprising a fourth diode coupled in parallel with the third transistor for allowing current to flow to the lamp during one of the positive half-cycle and the negative half-cycle of the dynamo.

17. The circuit according to claim 16 further comprising a fifth diode coupled in parallel with the second transistor.